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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,865	12/11/2003	Ashutosh Misra	Serie 6128	8090
<div>7590 11/17/2008</div> <div>Linda K. Russell</div> <div>Air Liquide</div> <div>Intellectual Property Dept.</div> <div>2700 Post Oak Blvd., Suite 1800</div> <div>Houston, TX 77056-5797</div>				
EXAMINER				
TURK, NEIL N				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/733,865

Applicant(s)

MISRA ET AL.

Examiner

NEIL TURK

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on August 13th, 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 and 34-44 is/are pending in the application.
- 4a) Of the above claim(s) 1-18 and 36-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-32, 34, and 35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/13/08, 12/11/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Remarks

This Office Action fully acknowledges Applicant's remarks filed on August 13th, 2008. Claims 1-44 are pending. Claims 1-18 and 36-44 have been withdrawn from consideration as being drawn to non-elected inventions. Claims 19-35 are currently under examination. Any objection/rejection not repeated herein has been withdrawn by The Office.

Drawings

The drawings are objected to under 37 CFR 1.83(a) because they fail to show **the portion of the transport conduit (e.g. slip stream) that is narrower than other portions of the chemical transport conduit** as described in the specification (see paragraph [0037] of Applicant's pre-grant publication US 2004/0166584). Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary

to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, **the transport conduit 130, as well as the possible locations of the slip stream must be shown in figure 5** or the feature(s) canceled from the claim(s). Currently, figure 5 only generally relates the slip stream 500 to the overall system and does not show any locations of the slip stream on transport conduit 130. No new matter should be entered. This is required with respect to claims 27-32.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to because **newly submitted** replacement sheet for **figure 5** contains discrepancies and lacks clarity in constitution with Applicant's specification. Newly submitted figure 5 has been amended from the previous version of figure 5 to now include the chemical transport conduit 130. However, such an amendment still places the figure under objection, as the chemical transport conduit 130 is now shown in figure 5 as a process block. Examiner asserts that the transport conduit is not a process block, but is merely a conduit for fluid flow. Examiner notes that figure 5 includes line 515 which appears to be a conduit. Is the line 515 the same as the transport conduit 130? Is the transport conduit 130 merely the conduit located upstream of the line 515? Examiner notes the description provided in paragraphs [0042,0043] in Applicant's pre-grant publication (US 2004/0166584). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: the disclosure that pertains to the slip stream is confusing and not clearly understood through the teachings of the specification. Applicant's specification (from the pre-grant publication US 2004/0166584) in paragraph [0037] recites that the reduction and reception of radiation in the chemical transport conduit 130 may be performed on a portion of the chemical transport conduit, e.g., a slip stream, that may be narrower than other portions of the chemical transport conduit. Applicant's specification in paragraphs [0042-0044]+ and figure 5, detail that a slip stream 500 may be placed at various

locations on the chemical transport conduit 130. However, figure 5 generally relates slip stream 500 to the overall system shown and does not show the transport conduit 130, nor the various locations at which the slip stream may be located. It is unclear if the slip stream is comprised of a side stream applied to a portion of the chemical transport conduit, or if the slip stream is the chemical transport conduit itself, or if the slip stream is a narrow portion within the chemical transport conduit, or if it is some combination or something else altogether. The specification further discloses that the control unit 230 may control the operation of the slip stream. It is unclear what operations the slip stream may carry out, as it appears to be disclosed as a conduit for flowing liquid.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how a relevant comparison is made between a refractive index and a predetermined tolerance level. Examiner asserts that this is not a parallel comparison. A detected refractive index would have to be compared against

another refractive index and then a check would be made to see if the relative difference between the two indices fell within a predetermined tolerance level. Further, claim 24 recites a predetermined tolerance level in two distinct fashions, which is unclear and not understood. It is unclear how the two predetermined tolerance levels are related. The first recitation to the predetermined tolerance level appears to be a check to see if the detected refractive index is close to a refractive index, where "close" is defined by the "predetermined tolerance level". The second recitation to the predetermined tolerance level references the chemical state of the process chemical, and this recitation does not appear to be concerned with a predetermined tolerance level, but more to a qualitative result of "good/acceptable" (for the case of the RI falling within the tolerance level), "bad/unacceptable" (RI does not fall within the tolerance level) with respect to the overall process chemical. However, as currently recited, the controller and its recited functionalities are unclear and indefinitely recited.

Claims 27-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation to the slip stream is unclear, indefinite, and not clearly understood in view of the specification. Applicant's specification (from the pre-grant publication US 2004/0166584) in paragraph [0037] recites that the reduction and reception of radiation in the chemical transport conduit 130 may be performed on a portion of the chemical transport conduit, e.g., a slip stream, that may be narrower than other portions of the chemical transport conduit.

Applicant's specification in paragraphs [0042-0044]+ and figure 5, detail a slip stream 500 which may be placed at various locations on the chemical transport conduit 130. Figure 5 generally relates slip stream 500 as the overall system shown and does not show the transport conduit 130 or the various locations at which the slip stream may be located. It is unclear if the slip stream is comprised of a side stream applied to a portion of the chemical transport conduit, or if the slip stream is the chemical transport conduit itself, or if the slip stream is a narrow portion within the chemical transport conduit, or if it is some combination or something else altogether. The specification further discloses that the control unit 230 may control the operation of the slip stream. It is unclear what operations the slip stream may carry out, as it appears to be disclosed as a conduit for flowing liquid.

The claims further recite various pressure regulators and valves associated with the slip stream. These recitations are unclear as the sampling stream is previously recited as being coupled to a portion of the chemical transport conduit, and such chemical transport conduit has not been structurally related or established with respect to the various valves and pressure regulators. Further, it is unclear how a slip stream, which is only coupled with a portion of the chemical transport conduit includes all of the valves and regulators as shown in figure 5. Applicant's specification discloses that a slip stream may be placed at various locations on the chemical transport conduit, but the recitations in the claims appear to place it at all locations and further, require that the slip stream is the chemical transport conduit. If the slip stream is only a portion of

the chemical transport conduit, or only coupled to a portion of the chemical transport conduit, how does the slip stream itself comprise the pressure regulators and valves? Examiner asserts that in looking at figure 5, it appears line 515 is the only piece shown that includes 1st pressure regulator 510 and first valve 520, and line 525 is the only piece shown that includes 2nd pressure regulator 550 and 2nd valve 530, and 3rd valve 540 appears at a junction of both lines.

Further, with regards to **claims 30-32**, it is unclear how a flow of cleansing agent is possible such that a source for providing such cleansing agent has not been recited in the claims.

Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the refraction index sensor comprises a flow cell for directing a flow of said process chemical into said refraction index sensor. Such that the claim recites, "...the refraction index sensor comprises:..." it is unclear how the sensor can be comprised of a flow cell that directs flow into the sensor. Is the flow cell external to the sensor, such as a conduit or funnel for directing to flow to the sensor? Does Applicant intend to recite that the flow cell is for directing a flow of said process chemical within said refraction index sensor? For purposes of examination, the flow cell may be external to the refraction index sensor so as to direct flow into the sensor (as claimed), or may be a flow cell within the sensor (i.e. sensor comprises the flow cell, as claimed).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 19-23 and 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vanell et al. (6,267,641), hereafter Vanell.

Vanell discloses a method of manufacturing a semiconductor component and a chemical-mechanical polishing system. Vanell discloses supply tanks for the CMP slurry, coupled to pumps 171 and 172 (abstract, lines 15-26, col. 4, fig. 1). Vanell further discloses an output port 113 connected to a channel with a flow rate sensor 160. Vanell discloses vessel 110 (process chemical unit, providing the mixed slurry for processing a semiconductor wafer), as well as a refractometer 150 (chemical analysis unit in constitution with control process/steps) and an output port 113 (process chemical transport conduit associated with the piping thereformed) (lines 28-67, col. 2+, figures). Vanell also discloses that the CMP system 100 may also include a carrier assembly for supporting a semiconductor substrate, as well as a platen (carrier and platen function as the processing tool to perform a function on the substrate) for mechanically polishing the semiconductor. Vanell further discloses measuring the concentration of hydrogen peroxide (limited lifetime due to decomposition into oxygen and water) in the CMP slurry by measuring the refractive index of a portion of the mixture (measured index of refraction is directly and linearly proportional to the concentration of the first component in the mixture) with refractometer 150, as it passes slurry sensing port 114 (directed thereto by mixing device 130 and walls 115, i.e. a flow cell for directing the process chemical to the sensor). Vanell also discloses that the refractometer 150 provides a second signal to adjust the flow rate of the first component of the CMP slurry. Vanell discloses that this fast, automated, and in-situ measurement provides a more accurate measurement of the concentration of the first component than a slow titration process (step 230; line 29, col. 2 through column 5, figs 1&2). Vanell further discloses that the

refractive index measurement of the first component at step 230 is subsequently used in feed back control to dictate a second injection rate for the first component of the mixture, and thus dictates the requisite make-up of the polishing mixture (col. 5&6, fig.

2). Examiner asserts that using the optically detected concentration of the first component to determine a second injection rate for the first component constitutes determining whether a chemical state of the process chemical (concentration of first component, i.e. hydrogen peroxide) is within a predetermined tolerance level in an online manner in response to the refraction index. Examiner asserts that using the measured concentration (from refraction index) to calculate a second injection rate inherently shows a determination of whether the chemical state (concentration) is within a predetermined tolerance level (proper mixture) such that a known concentration is sought after in order to make the final mixture for use in polishing the substrate (lines 18-22, 49-56, col. 1). Examiner further asserts that as Vanell discloses an automated an in-situ process, and a controller is implicitly recited within the device for carrying out the recited functions and steps.

Vanell does not disclose that the chemical analysis unit performs an analysis of the process chemical in the process chemical transport conduit.

It would have been obvious to one of ordinary skill in the art to modify the Vanell device to move the refractometer from its position at sensing port 114 to a position with respect to the output port 113 and its conduit such that this is an obvious change of location of the refractometer, in which the refractometer would still be able to detect refractive index and thus concentration of the component in an automated and in-situ

fashion for the desired purpose of updating the required amount/flow of the first component to make the desired slurry, such that the transport conduit carrying such slurry is located before (upstream of) the processing tool.

If the Vanell device is not taken to have an implicitly recited controller for carrying out the automated, in-situ measurements/processes, than it would have been obvious to modify Vanell to include a controller such that a controller is well-known for accomplishing automated processes and feed-back control operations, such as desired by Vanell.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanell in view of Shiraishi et al. (5,501,870), Shiraishi.

Vanell does not specifically disclose a controller adapted to compare the refractive index to a predetermined tolerance level stored in a library to determine if the chemical state of the process liquid is within a predetermined tolerance level.

Shiraishi discloses an apparatus for applying a hydrophobic treatment to a semiconductor wafer in which a concentration of the HDMS treating liquid is monitored and supplied to CPU 5 for comparison with a predetermined reference value. Shiraishi further discloses that based on the comparison, the CPU 5 controls the temperature control section so as to control the temperature of the supporting table for a desired treating temperature, so as to coincide with the change in HDMS concentration (abstract; lines 17-28, col. 7, fig. 2). Shiraishi thereby discloses monitoring a parameter

in the processing of a semiconductor wafer and comparing such a measured parameter for the purpose of controlling the overall processing of the wafer to the desired standard.

It would have been obvious to modify Vanell to have a controller adapted to compare the relevant parameter (refractive index, and thereby first component concentration, as related to Vanell) to a predetermined reference value for the purpose of determining the chemical state of the process chemical such as taught by Shiraishi in order monitor the relevant parameter in order to dictate or control the overall processing of the slurry, which is thereby applied to process the wafer properly.

Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vanell in view of Luger (4,012,199).

Vanell has been discussed above.

Vanell does not specifically disclose a temperature sensor to determine a temperature of the process chemical.

Luger discloses a temperature sensor 200 for determining the temperature of a process liquid so as to help maintain it at a proper temperature (columns 13, 14, &21, fig. 17).

It would have been obvious to modify the Vanell device to include a temperature sensor for determining a temperature of the process chemical such as taught by Luger in order to provide means for indicating the temperature of the process liquid so as to provide indication that the process liquid is in a satisfactory temperature for the assay.

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanell in view of Ono et al. (4,943,725), hereafter Ono.

Vanell has been discussed above.

Vanell does not specifically disclose a charge coupled device for detecting the refraction index.

Ono discloses a radiation read-out apparatus in which the reading light reflected and modulated in accordance with the distribution of light refractive indices is received by a two-dimensional charge-coupled device (lines 1-50, col. 3).

It would have been obvious to modify Vanell to include a charge-coupled device such as taught by Ono in order to provide a known means for receiving radiation in order to achieve the desired refractive index measurement.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vanell in view of Molloy (6,245,578).

Vanell has been discussed above.

Vanell does not specifically disclose that the refraction index sensor comprises a surface plasmon unit.

Molloy discloses such SPR sensors as being well known and conventionally used for measuring refractive index (lines 9-17, col. 1+).

It would have been obvious to modify the Vanell device to utilize a surface plasmon unit as a sensor for measuring refractive index such as taught by Molloy so as to provide a known means for achieving the desired refractive index measurement.

Response to Arguments

Applicant's arguments filed 8/13/08 have been fully considered but they are not persuasive.

With regards to the objection to the drawings, Applicant traverses the objection. Applicant argues that the structural detail is not essential for proper understanding of the invention. Applicant argues that in reading paragraph 0037 one of skill in the art would understand that the diameter of the slipstream portion, which "tees" off of the transport conduit, may have a smaller diameter than the transport conduit. Examiner argues that, first, it is not seen in paragraph 0037 where a slip stream is defined as a "tee-ing off" portion of the transport conduit, and further, none of the drawings provide to show the transport conduit 130, in which portions are designated as slip streams 500. Further, figure 2 does not label or show a slip stream in any portion of the chemical transport conduit. Applicant also argues that figure 2 shows lines branching off from the transport conduit which are narrower than the chemical transport conduit. Examiner argues that these lines are not labeled as such, as none of the lines are given the designation 500 for a slip stream. Examiner further argues that such lines shown in figure 2 appear to be leads or connections from the radiation source, temperature sensor, and refractive index sensor, to the transport conduit, and not slip streams that provide for directing a portion of the process chemical in the transport conduit 130 (paragraph 0042). As discussed above, the drawings are maintained objected. Further, newly submitted figure 5 is objected to, as discussed above.

With regards to the objection to the specification, the objection is maintained as Applicant has not presented arguments with respect to such an objection, and the specification has not been amended in a way to remove the rejection.

With regards to claims 27-32 rejected under 35 USC 112, 2nd paragraph, Applicant traverses the rejection. As similarly discussed above, paragraph 0037 does not disclose that a slip stream is defined as a tee-off portion of the transport conduit 130, and further the none of the drawings provide evidence or showings with respect to the slip stream as defined in claims 27-32. Additionally, as discussed above, Examiner asserts that in looking at figure 5, it appears line 515 is the only piece shown that includes 1st pressure regulator 510 and first valve 520, and line 525 is the only piece shown that includes 2nd pressure regulator 550 and 2nd valve 530, and 3rd valve 540 appears at a junction of both lines.

With regards to claim 24 rejected under 35 USC 112, 2nd paragraph, Applicant traverses the rejection. Whereas the Examiner understands what Applicant may be intending to recited, Examiner asserts that the recitation is unclearly recited. The relative comparison being made is not properly recited. Does Applicant intend to claim, "...wherein said controller is adapted to compare said refraction index to a predetermined tolerance level stored in a library to determine whether said chemical state of said process chemical is within said a predetermined tolerance level."

(emphasis added) Examiner asserts such a recitation would cure the current lack of clarity.

With regards to claim 35 rejected under 35 USC 112, 2nd paragraph, Applicant traverses the rejection based on the amendment currently made herein. Examiner asserts that Applicant's arguments are moot as a new grounds of rejection has been presented with respect to claim 35, based on Applicant's amendment.

With regards to claims 19-23 and 27-32 rejected under 35 USC 103(a) over Vanell et al. (6,267,641), Applicant traverses the rejection.

Applicant argues that Vanell discloses a refractometer that is integral to the chamber, and one of ordinary skill in the art would not find a teaching or motivation in Vanell '641 for locating a refractometer upstream from the chamber such that the refractometer was not integral, and is located on a slipstream, as per the claims of the instant invention. Applicant thereby argues that Vanell teaches a refractometer on the main flow path and one of ordinary skill in the art would not recognize the need to locate a refractometer on a slipstream from Vanell. Examiner first argues that Applicant's arguments are not commensurate in scope with the claims. Examiner argues that claim 19 does not recite that the refraction index sensor (of the chemical analysis unit) is located on a slipstream of the chemical transport conduit. Claim 19 recites in functional terms that there is a chemical analysis unit "to perform an online analysis of said process chemical in said process chemical transport conduit..." This recitation points to

a functionality of the chemical analysis unit to perform an analysis of the process chemical in the transport conduit, and does not structurally recite and limit the refraction index sensor to be located on a slipstream of the transport conduit. Thereby, it would have been obvious to modify Vanell, as discussed above, as such a modification would be a realized alternative and effective positioning of the refractometer away from the vortex of the CMP slurry and below the fill line, as desired by Vanell (see, lines 40-50, col. 3, which points to having the refractometer and sensing port at a place that is above the mixing vortex and below the fill line in the tank), to allow for proper sensing to make the preferred slurry.

Applicant further argues that Vanell neither teaches nor suggests the need for locating the refractometer such that it is accessible for periodic calibration and cleaning. Applicant's argument is not commensurate in scope with the claims. It is not seen in the claims where such a need for accessibility for calibration and cleaning is required. Additionally, the claims are drawn to an apparatus, and thereby processing steps such as calibrating and cleaning are not afforded patentable weight in the claims. Applicant must point out the structural differences of the prior art with respect to the claimed subject matter. In this instance, Applicant has not argued which structural elements of the claims are missing in Vanell. Does Applicant intend to claim a calibrating and cleaning structure, structurally related to the other elements?

Applicant further argues that one of ordinary skill in the art would not find a teaching or suggestion in Vanell as to the introduction of a cleaning solution based upon a measured drift in readings/signals from the refractometer. Applicant's argument is not

commensurate in scope with the claims. It is not seen in the claims where such a disclosure in the prior art is required. Further, such an assertion is drawn to a process claims, which even if they were added to the claims, would not be afforded patentable weight, as the claims are drawn to a device and the claims must be patentably distinguishable over the prior art in terms of structure, and not in terms of processes/functions.

With regards to claims 24-26, 34, and 35 rejected under 35 USC 103(a) over Vanell in view of various prior art, as discussed above, Applicant traverses the rejections. Applicant argues that the various pieces of prior art provided in each of the rejections of claims 24, 25, 26, 34, and 35 do not cure the deficiencies of Vanell, and thereby the rejections are improper. Examiner argues, as discussed above, that Vanell does not have such deficiencies, and thereby, the claims are rejected properly.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEIL TURK whose telephone number is (571)272-8914. The examiner can normally be reached on M-F, 9-630.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NT

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1797